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INTRODUCTION.

This REVIEW is based on reports for February, 1891, from 2,302 regular and voluntary observers. These reports are classified as follows: 172 reports from Signal Service stations; 118 reports from United States Army post surgeons; 1,466 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 181 reports through the Central Pacific Railway Company; 334 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Meteorological Report of Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, and Wisconsin, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR FEBRUARY, 1891.

The month was warmer than the average February east of a line traced from Lake Superior to west Texas; to the westward of this line the month was colder than usual. The greatest departure above the average temperature occurred from the lower lake region to the North Carolina coast, where it exceeded 5°, and the most marked departure below the average temperature was noted on the northeast slope of the Rocky Mountains, where it was more than 10°. At Jacksonville, Fla., the month was the warmest, and at Valentine, Nebr., and San Carlos, Ariz., it was the coldest February on record. The highest maximum temperature reported by a regular station of the Signal Service was 97°, at Rio Grande City, Tex., and by a voluntary observer, 99°, at Fort Ringgold, Tex. At a number of stations in the south Atlantic and Gulf states, and at Keokuk, Iowa, and Escanaba, Mich., the maximum temperature was as high or higher than previously reported for February. The lowest minimum temperature reported by a regular station of the Signal Service was —36°, at Fort Custer, Mont., and by voluntary observers, —46°, at Breckenridge and Gunnison, Colo. At Fort Stanton and Santa Fé., N. Mex., and San Diego, Cal., the minimum temperature was the lowest ever reported for February. The cold weather of the 26th and 27th in the Gulf and south Atlantic states injured early fruit and vegetables.

More than double the usual amount of precipitation fell on the middle and south Pacific coasts and over the southern plateau region; in the Missouri Valley, the Ohio Valley and Tennessee, the lower lake region, and the middle Atlantic states the monthly precipitation was about one-half greater, and over the northern plateau, on the northeast slope of the Rocky Mountains, in the upper lake region, and in New England it was about one-fourth greater than the February average. In the lower Rio Grande valley, on the middle-eastern slope of the Rocky Mountains, and at Key West, Fla., less than one-half the usual amount of precipitation fell, and in the west Gulf and south Atlantic states and on the southeast slope of the Rocky Mountains one-half to three-fourths of the average amount for February was reported. In southeast Massachusetts, at Albany, N. Y., and at stations in North Carolina, Georgia, Tennessee, Louisiana, Minnesota, South Dakota, New Mexico, Arizona, Montana, Colorado, and Oregon the monthly precipitation was the heaviest, and in northeast Florida, and at stations in Arkansas, Texas, Indian Territory, and northwest Washington it was the least ever reported for February. Snowfall of more than 100 inches was reported at Rico, Colo., and Alta, Utah; more than forty inches fell at stations in central New York, south-central and north-central Oregon, and extreme northwest Wyoming, and more than thirty inches fell in northeast Nevada, north-central New Mexico, central Wisconsin, and south Vermont. The heavy rainfall in Louisiana, Tennessee, and the east Gulf states caused serious interruption to farm work. The general and heavy rains of the middle of the month in California ended a serious and long-continued drought in that region.

Destructive floods occurred in Arizona, California, and along the Ohio River and tributaries. Owing to heavy rains the Gila and Colorado rivers and tributaries began to rise on the 15th, the rise reaching Yuma, Ariz., on the 19th. The night of the 21st the water was within four feet of the top of the levee built on the south side of the town to protect it from the overflow of the backwater of the Gila River. The evening of the 22d the levee broke and by 9 p. m. one-half of the town was in ruins. On the 26th, at 8 p. m., the water was above the scale on the gauge at Yuma, and the embankment, which had been repaired, again gave way. On the 27th the water reached 33.2 feet at Yuma, 4 feet 8 inches higher than ever before recorded at that place, and it was probably about 4 inches higher during the night. The loss of private property in Yuma by the flood was estimated at over $300,000. No trains had arrived or departed from the 22d to the close of the month. The destruction by flood was also very great throughout Arizona and southern California, and freshets occurred in the Sacramento Valley.

On the 1st the Ohio River was rising rapidly at Cincinnati, Ohio, and on the 6th reached 47.9 feet, 2.9 feet above the danger-line, and then commenced to fall. On the 13th and 16th the river again passed the danger-line at Cincinnati. On the 17th the rivers passed the danger-line at Pittsburgh, and at 11 p. m. the Monongahela River stood at 29.9 feet, 7.9 feet above the danger-line. Portions of Allegheny City were flooded and travel on the street railroad between Pittsburgh

and Allegheny City was suspended. On this date the river rose 11 feet at Parkersburgh, W. Va. On the 18th the river reached 31.3 feet at Pittsburgh, after which it fell. In the Allegheny River the water reached 32 feet on the 7th street bridge in the early morning; with the exception of the stage reached February 6, 1884, this was the highest stage ever recorded at that place. Streets in low-lying parts of Pittsburgh and Allegheny City were flooded. On the 20th the river reached 44 feet 10 inches at Parkersburgh, W. Va., at midnight, the highest stage noted in 60 years, save in February, 1884, when 54 feet 2 inches was reached. On the 22d 54.8 feet was reached at Cincinnati, and parts of Cincinnati and Newport, Ky., were flooded. At Louisville, Ky., the river was 1.6 foot above the danger-line. On the 23d the river reached 56 feet at Cincinnati, and many houses were abandoned in submerged districts. Immense damage had been caused, and large areas continued under water along the Ohio River and tributaries. At Louisville the river reached 27.7 feet. On the 25th the river was 57.4 feet and stationary at Cincinnati, and the water had risen 16 feet in 6 days. On the 26th the stage of the water at Louisville was 32.3 feet, and the river was falling at Cincinnati.

The Tennessee River reached a dangerous stage at Chattanooga, Tenn., on the 10th, and was rising rapidly at Knoxville. On the 12th portions of Chattanooga were flooded; the river was 2.5 feet above the danger-line, and considerable of the surrounding country was flooded. On the 14th the river reached 37.55 feet at Chattanooga, and then began to fall. Another rise occurred at Chattanooga from the 22d to 25th. On the 15th the Cumberland River rose above the danger-line at Nashville, Tenn., reaching 41.2 feet. On this date a rise in the Sacramento River flooded a part of Red Bluff, Cal., and caused damage in Butte county. On the 16th about one-half of Johnstown, Pa., was flooded by a rise in the Conemaugh River. On the 17th there was a flood in the west branch of the Susquehanna River. On the 20th the Susquehanna River was 2 feet above the danger-line at Harrisburg, Pa., and had risen 5 feet during the preceding night, causing much damage. On the 26th floods occurred along the Hudson River and in streams in central and east New York. On the 13th the Mississippi River reached the danger-line, 40 feet, at Cairo, flooding bottom lands. On the 22d the river reached a dangerous stage at Natchez, Miss. On the 23d the Mississippi River was dangerously high from Memphis, Tenn., southward. On the 24th the lower Mississippi was at or near the danger-line at several points. On the 25th the river was 44.3 feet and rising at Cairo. On the 26th the water reached the danger-line, 33 feet, at Memphis, Tenn., and was 1.9 foot above the danger-line at New Orleans, La. At the close of the month the river was 5.5 feet above the danger-line and rising slowly at Cairo; it stood at the danger-line at Memphis, and was 2.2 feet above the danger-line at Vicksburg, Miss.

Tornadoes were reported as follows: Helena, Ark., 9th; damage $5,000. Troy, Mo., 24th; damage $2,000. Utica, Ind., about midnight 24–25th; damage $6,000. Severe local storms were reported at Soapstone Mount, N. C., on the 11th; at Cape Giradeau, Mo., on the 20th; at Sunbury, N. C., on the 22d, damage $4,000, and one child killed; at Berkeley, Cal., on the 23d; at Newcastle, Ky., on the 24th, damage $2,000; and at Abilene, Tex., on the 25th. Heavy thunder-storms occurred at Eureka, Cal., on the 16th; at San Antonio, Tex., on the 20th; at West Bend and Manson, Iowa, on the 24th; at Louisville, Ky., the night of the 24–25th; and in southeast Massachusetts on the 28th.

Navigation was resumed on the lower Connecticut River on the 11th. The Hudson River was open from Newburgh to New York City on the 25th. At Iowa and upper Illinois ports the Mississippi River opened and closed at intervals during the month. On the 9th auroras were observed in Indiana, Iowa, Minnesota, South Dakota, and Wisconsin; on the 11th in Illinois, South Dakota, Wisconsin, Michigan, Massachusetts, New Hampshire, and Maine; on the 12th in Maine, Massachusetts, Michigan, and Montana; and on the 14th in Illinois, Michigan, Massachusetts, New Hampshire, and Maine.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for February, 1891, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars. The departure of the mean pressure for February, 1891, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
New Orleans, La	+.001	Pittsburgh, Pa	+.014
Memphis, Tenn	+.002	Washington City	+.015
Eastport, Me	+.002	Lynchburgh, Va	+.015
Saint Louis, Mo	+.003	Saint Paul, Minn	−.001
Duluth, Minn	+.005	Moorhead, Minn	−.002
Albany, N. Y	+.006	Bismarck, N. Dak	−.002
Nashville, Tenn	+.007	Omaha, Nebr	−.003
Key West, Fla	+.008	Galveston, Tex	−.006
Cleveland, Ohio	+.008	Santa Fé, N. Mex	−.008
Wilmington, N. C	+.008	Salt Lake City, Utah	−.010
Chicago, Ill	+.009	Abilene, Tex	−.011
Atlanta, Ga	+.009	Fort Assinniboine, Mont	−.012
New York City	+.010	Portland, Oregon	−.014
Boston, Mass	+.012	San Francisco, Cal	−.016
Jacksonville, Fla	+.013	El Paso, Tex	−.016

The mean pressure was highest along the south Atlantic coast, where it was above 30.15, and it was above 30.10 in the British Possessions north of east Montana. The mean pressure was lowest in west Washington, where it was below 29.85, and it was below 29.95 in a small area which extended over the east-central part of the middle plateau region, over the west part of the middle plateau region, and on the Pacific coast north of the 40th parallel. On the Pacific coast north of the 34th parallel, in the plateau region, except over the southeast part, generally over the upper lake region, and in the lower Saint Lawrence valley, New Brunswick, and east Nova Scotia the mean pressure was below 30.00.

On the Pacific coast north of the 34th parallel and over the west parts of the middle and northern plateau regions the mean pressure was the lowest reported for February since 1878, and during the storm of the 22–23d the barometer readings were the lowest ever reported for February at a number of stations on the middle and south Pacific coasts.

A comparison of the pressure chart for February, 1891, with that of the preceding month shows that there was a general decrease in mean pressure, except along the Atlantic coast north of Georgia and in the British Possessions north of Montana and North Dakota. The greatest decrease in mean pressure occurred over north-central Nevada, where it was more than .40, and the decrease was more than .20 over the middle and northern plateau regions and on the middle and north Pacific coasts. At stations on the immediate middle Atlantic, south New England, and Nova Scotia coasts, and in the British Possessions north of Montana the increase in mean pressure was more than .05. The remarkable decrease in mean pressure over the middle and northern plateau regions and on the middle and north Pacific coasts was largely due to the exceptionally low barometer which attended the storm of the 21st–24th.

The mean pressure was below the normal over the entire country, save at a number of stations on the immediate Atlantic coast north of Georgia, where it was slightly above the normal. The most marked departure below the normal was noted on the north Pacific coast, where it exceeded .20, and